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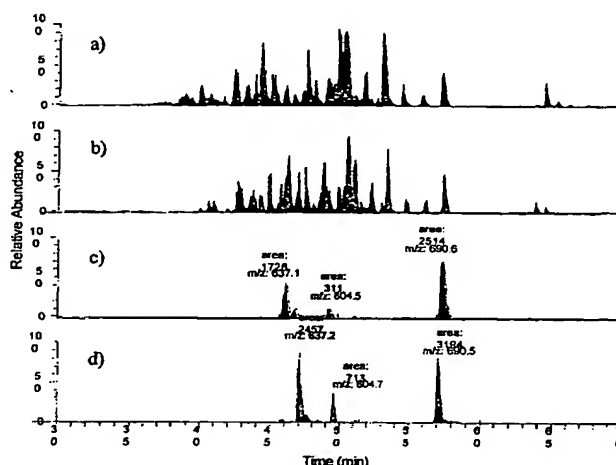


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- (71) Applicant (for all designated States except US):
THERMO FINNIGAN, LLC [US/US]; 355 River Oaks Parkway, San Jose, CA 95134 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): BONDAREKO, Pavel, V. [US/US]; 1774 Blossom Court, Thousand Oaks, CA 91320 (US). SHALTER, Thomas, A. [US/US]; 3910 Springfield Common, Fremont, CA 94555 (US). CHELIUS, Dirk, H. [DE/US]; 4178 Glenwood Drive, Scotts Valley, CA 95066 (US).
- (54) Title: QUANTITATION OF BIOLOGICAL MOLECULES
- (74) Agent: PORTER, Timothy, A.; Fish & Richardson, P.C., 500 Arequello Street, Suite 500, Redwood City, CA 94063 (US).
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(57) Abstract: Methods and apparatus, including computer program products, for quantifying peptides in a peptide mixture. A peptide mixture containing a plurality of peptides is received. One or more peptides are separated from the peptide mixture over a period of time. One or more of the peptides separated at a particular time are subjected to mass-to-charge analysis and an abundance of one or more of the mass analyzed peptides is calculated. A relative quantity for the one or more mass analyzed peptides is calculated by comparing the calculated abundance of the peptides with an abundance of one or more peptides in a reference sample that is external to the first peptide mixture. The techniques can be applied to arbitrary peptides, without requiring the use of differential mass labeling, and can be applied to other biological molecules, such as nucleic acids and small molecules.

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